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Pinschmidt

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(54) MOTOR VEHICLE

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See application file for complete search history.

(56)References Cited

U.S. PATENT DOCUMENTS

3/2014 Sten F16H 48/36 475/150 8,874,289 B2 * 10/2014 Tanba B60K 6/387 180/6.2 5/2007 Yokoyama et al.

2007/0123383 A1

(Continued)

FOREIGN PATENT DOCUMENTS

CN CN 1428256 7/2003 3/2009 101386267 (Continued)

OTHER PUBLICATIONS

European Search Report with respect to counterpart European patent application EP 15 00 1383.

(Continued)

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(57)ABSTRACT

A motor vehicle, includes a drive motor for driving the motor vehicle, at least one additional motor and at least one differential for distributing a torque generated by the drive motor and transmitted by a drive shaft to a driven differential element of the differential to two output shafts. The motor vehicle includes a coupling device which can be controlled by a control device, and in a first coupling state directly or indirectly couples the additional motor with an output shaft, thereby rendering the distribution of the drive torque to the output shafts dependent on an additional torque exerted by the additional motor, and in a second coupling state directly or indirectly couples the additional motor with the driven differential element.

17 Claims, 3 Drawing Sheets

